



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/575,898

04/14/2006

Kohei Shimoda

050395-0369

4687

20277 7590 04/24/2009  
MCDERMOTT WILL & EMERY LLP  
600 13TH STREET, N.W.  
WASHINGTON, DC 20005-3096

EXAMINER

SHEVIN, MARK L

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

04/24/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/575,898	<b>Applicant(s)</b> SHIMODA ET AL.	
	<b>Examiner</b> MARK L. SHEVIN	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 February 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 6-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 6-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Status of Claims*

1. Claims 1 and 6-10, filed February 18<sup>th</sup>, 2009 are pending. Claims 1 and 6 were amended and claims 2-5 and 11-12 are cancelled.

### *Acknowledgement of RCE*

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 18<sup>th</sup>, 2009 has been entered.

### *Status of Previous Rejections*

3. The previous rejection of claims 1, 6, and 9-12 under 35 U.S.C. 103(a) over **Schmidt** (US 5,590,387) in view of **Moritz** and **Sommer** in the Office action dated December 10<sup>th</sup>, 2008 have been withdrawn in view of the amendments to claims 1 and 6 and the cancellation of claims 11 and 12.

4. The previous rejection of claims 7-8 under 35 U.S.C. 103(a) over **Schmidt** in view of **Moritz**, **Sommer**, and **Bouaricha** (US 2004/0208775 A1) in the Office action dated December 10<sup>th</sup>, 2008 have also been withdrawn in view of the amendments to claims 1 and 6 and the cancellation of claims 11 and 12.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Claim Rejections - 35 USC § 103***

5. **Claims 1, 6, and 9-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hirai** (US 6,136,228) in view of **Moritz** (T. Moritz and A. Nagy, Preparation of super soft granulate from nanosized ceramic powders by spray freezing, *Journal of Nanoparticle Research*, Vol. 4, (2002), p. 439-448), and **Sommer** (K. Sommer. "Size Enlargement". In *Ullmann's Encyclopedia of Industrial Chemistry*, June 15, 2000, p. 1-15 and 37-40).

Hirai:

Hirai discloses a granular metal (for example Ag70Pd30 or Au: col. 22, table 22, P-3 or P-10) powder that is used as a conductive coating (col. 1, line 8) and that:

a) is produced by the steps of (col. 18, lines 9-32: ex. 1):

a1) preparing a solution comprising the following components (which may also be created during the preparation of the solution, meaning the latest before step a2):

a1a) a mixed solvent of 40% methanol and 60% water

a1b) metal particles such as au (being created from chloroauric acid) having an average particle diameter of 5-100 nm (col. 22, table 1) and

a1c) polyvinyl alcohol (same as in the instant application, Specification, p. 15, ex. 5); and

a2) removing most of the solvent from the solution by heating at 90 °C for 5 hours.

Art Unit: 1793

b) The powder contains polyvinyl alcohol.

c) As the metals disclosed by Hirai are identical to those of the instant application and as the process is substantially similar, the apparent density of the granular metal of D1 would be expected to have an apparent density falling in the claimed range of 1.0 - 5.0 g/ml

Hirai, however, does not specifically disclose the water content of the granular metal powder.

#### Moritz

Moritz, drawn to the granulation of nanosize powders, teaches that nanoparticles such as ceramic particles possess poor flowability, very low bulk density, and tend to fly off as dust (p. 439, col. 2, para 3) which necessitates granulation to increase particle size, which improves transport, storage, and processing (p. 440, col. 1, para 1). Variables shown to affect the strength of the granules and their dispersibility include residual moisture (water) content (Figure 13). Higher moisture content lead to stronger granules.

#### Sommer

Sommer, drawn to the size enlargement of particles (p. 1, introduction), teaches that spray agglomeration (similar to what was taught by Moritz above) is the most commonly used method in the chemical industry with agglomerates in the 20 - 500 micron range and production rates of up to 50 tons per hour. (p. 2, col. 2, Table 1).

Sommer teaches that when fine particulate properties are required for processing or application, agglomerates must be easily broken down and when

Art Unit: 1793

the agglomerate is to be dissolved during use, the required redispersibility depends on the wettability (p. 14, col. 2, para 3). Depending on the wetting angle of the powder, the apparent density will need to be greater than the density of the liquid dispersion medium (p. 15, col. 1, para 2). The optimal porosity and thus the optimal apparent density is the one that gives the shortest overall reconstitution time (p. 15, col. 23, para 1).

Regarding claims 1 and 6, it would have been obvious to one of ordinary skill in powder granulation, at the time of the invention, to produce a granular metal powder that contains an organic compound, has an apparent density in the claimed range, and has a water content in the claimed range as Hirai taught forming granular metal powder which contains a residual organic compound as it is produced by a substantially similar process as that of the instant specification, Moritz taught water (moisture) content as a result effective variable in the strength of granules, and lastly Sommer taught that the apparent density is a result effective variable in the redispersability of metal agglomerates and should be above the density of the dispersion medium, which in the case of Hirai and Moritz was water (density  $\sim 1 \text{ g/cm}^3$ ), which suggests an apparent density of more than  $1 \text{ g/cm}^3$ . Motivation to choose the instantly claimed apparent density and water content ranges comes from process optimization, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See In re Boesch, 205 USPQ 215 (CCPA 1980). MPEP 2144.05, para I states:

Art Unit: 1793

"In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists."

In particular, with respect to claim 1, From MPEP 2113: "The Patent Office bears a lesser burden of proof in making out a case of *prima facie* obviousness for product-by-process claims because of their peculiar nature" than when a product is claimed in the conventional fashion. *In re Fessmann*, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983).

Regarding claims 9 and 10, Hirai discloses polyvinyl alcohol as the organic compound (capable of being absorbed on the surface of the metal particles), which is the same as what was used in the instant specification (same as in the instant application, Specification, p. 15, ex. 5).

**6. Claims 7 and 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hirai** (US 6,136,228) in view of **Moritz** and **Sommer** as applied to claims 1, 6, and 9-10 above, in further view of **Bouaricha** (US 2004/0208775 A1).

Art Unit: 1793

The disclosures of Hirai, Moritz, and Sommer were discussed above, however none of the references disclosed the particle size of the metal granulates.

Bouaricha

Bouaricha, drawn to the agglomeration of nanoparticles into micrometric particles (para 0001), teaches that one of primary limitations of nanoparticles in general is that they cannot be processed directly in many applications due to extremely low density and flowability (para 0004). Thus there is a vital need for densifying and consolidating by agglomeration of particles into micron-size particles for processing (para 0004). A suitable size for agglomerates to enable easier handling is in the range of 1  $\mu\text{m}$  – 100  $\mu\text{m}$  (para 0015).

It would have been obvious to one of ordinary skill in powder granulation, at the time of the invention, to form a granulate in the size range of 1 - 100 microns as Bouaricha taught that this size range is suitable for easier handling compared to the primary nanoparticles or nanopowders.

***Response to Applicant's Arguments:***

7. Applicant's arguments filed February 18<sup>th</sup>, 2009 have been fully considered but they are not persuasive.

Applicants assert (p. 4, para 3 to p. 5, para 4) that Schmidt, nor any of the other cited references disclose the amended subject matter of claims 1 and 6 in requiring Au, Ag, or alloy granular metal powders because Schmidt only



Art Unit: 1793

discloses base metal or ceramic powders, and Moritz, Sommer, and Bouaricha do not disclose Au or Ag powders.

In response, the new grounds of rejection raised in the instant Office Action with the citation of Hirai (US 6,136,228) fully addresses the amended subject matter of claims 1 and 6 in requiring the granular metal powder be "composed of a metal selected from the group consisting of Ag, Au, and an alloy of each of Ag and Au..."

### ***Conclusion***

**-- Claims 1 and 6-10 are rejected**

**-- No claims are allowed**

The rejections above rely on the references for all the teachings expressed in the texts of the references and/or one of ordinary skill in the metallurgical art would have reasonably understood or implied from the texts of the references. To emphasize certain aspects of the prior art, only specific portions of the texts have been pointed out. Each reference as a whole should be reviewed in responding to the rejection, since other sections of the same reference and/or various combinations of the cited references may be relied on in future rejections in view of amendments.

All recited limitations in the instant claims have been met by the rejections as set forth above. Applicant is reminded that when amendment and/or revision is required, applicant should therefore specifically point out the support for any amendments made to the disclosure. See 37 C.F.R. § 1.121; 37 C.F.R. Part §41.37 (c)(1)(v); MPEP §714.02; and MPEP §2411.01(B).

Art Unit: 1793

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark L. Shevin whose telephone number is (571) 270-3588 and fax number is (571) 270-4588. The examiner can normally be reached on Monday - Friday, 8:30 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy M. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

***/Mark L. Shevin/***  
Examiner, Art Unit 1793

April 16th, 2009  
10-575,898

***/George Wyszomierski/***  
Primary Examiner  
Art Unit 1793